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10/530,999

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Johan Loccufier

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EXAMINER

ZIMMERMAN, JOSHUA D

ART UNIT

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2854

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/530,999	<b>Applicant(s)</b> LOCCUFIER ET AL.	
	<b>Examiner</b> JOSHUA D. ZIMMERMAN	<b>Art Unit</b> 2854	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16,17,21-26,28-34 and 38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16,17,21-26,28-34 and 38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 16, 17, 21-28, 31-37 and 38 are rejected under 35 U.S.C. 103(a) as being anticipated by Kunita et al. (US 2001/0009129) in view of Kinsho et al. (US 5,837,785), further in view of Ding et al. (US 5,994,430), and further in view of applicants' admitted prior art (AAPA).

Regarding claim 16, Kunita et al. disclose "a heat-sensitive lithographic printing plate precursor (paragraph 2) comprising a support having a hydrophilic surface and an oleophilic coating provided on the hydrophilic surface (paragraph 23), said coating comprising (i) an infrared light absorbing agent (paragraph 23) and (ii) a polymer comprising a phenolic monomeric unit (paragraphs 190-191)."

Kunita et al. fail to specifically disclose that the polymer comprises a "phenolic monomeric unit wherein the phenyl group of the phenolic monomeric unit is substituted by" the specified group and that "wherein S is covalently bound to a carbon atom of the phenyl group." However, Kunita et al. teach that the heterocyclic group is attached either to the main chain or the side chain of the main polymer by an appropriate linking chain, including S and thioethers (paragraph 197). Kunita et al. also teach using novolac resins as the main polymers (paragraph 191), and using them in any or all of

the embodiments (paragraph 198). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to use novolac resins as the backbone chain, in order to enhance the film strength. One having ordinary skill in the art would also recognize that when substituting novolacs (polyvinylphenols), there are only three options for the location of the substitution: on a carbon of the vinyl portion, on a carbon of the phenyl portion, or on the hydroxyl group.

Kinsho et al. teach the desire and ability to incorporate heterocyclic molecules into Novolac chains (a polyvinylphenol) in order to improve the storage stability of the polymer (abstract).

Ding et al. teach the heterocyclic substitution of polyvinylphenols via the carbon atoms of the phenyl portion (see the compound drawn in column 4 Ding et al., and component Y) in order to achieve a desired aqueous solubility (sentence bridging columns 4 and 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use novolac polymers as the base of the heterocyclic polymer of Kunita et al. in order to improve the storage stability, as taught by Kinsho et al.

It further would have been obvious, to substitute at a carbon of the phenyl group, as taught by Ding et al. Furthermore, one having ordinary skill in the art could at once envisage a scenario wherein the substitution is made on a carbon of the phenyl group, since there are only three options for substitution, if one only considers the different types of bonding positions available. And if one were to consider the actual *number* of places available for bonding (on a basic polyvinylphenol), there are only six sites

available for substitution: four carbon atoms on the phenyl group, one carbon on the vinyl group, and on the oxygen atom in the hydroxyl group. Therefore, four out of six, or 67%, of the sites available for substitution would be a carbon atom of the phenyl group.

Lastly, even if the aforementioned motivations were not sufficient, which they are not, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute at the carbon atom of the phenyl group instead of the oxygen atom of the hydroxyl group in order to maintain the amount of hydroxyl groups available. One having ordinary skill in the art would recognize that the number of hydroxyl groups in a polymer is a results-effective variable, which affects the solubility in a developer solution. Even though applicants in the reply filed on 5/02/07 submitted this information, this knowledge was available to those having skill in the art *at the time of the invention* (as evidenced by Ding et al.) and therefore use of this knowledge as motivation is not improper hindsight.

Kunita et al. as modified also fail to teach “wherein said coating further comprises a dissolution inhibitor.” AAPA teaches the use of a dissolution inhibitor (page 22 of applicants’ disclosure, last paragraph) in order to control the dissolution rate of the hydrophobic polymer in the developer (page 22, 2<sup>nd</sup> full paragraph). It would have been obvious to one of ordinary skill in the art at the time of the invention to use dissolution inhibitors in the printing plate of Kunita et al. and Kinsho et al. in order to control the dissolution rate of the hydrophobic polymer in the developer.

Regarding claim 17, AAPA further teaches “wherein said dissolution inhibitor is selected from the group consisting of an organic compound which comprises at least

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one aromatic group and a hydrogen bonding site, a polymer or surfactant comprising siloxane or perfluoroalkyl units and mixtures thereof (see the entire page 22 of applicants' disclosure)."

Regarding claim 21, Kunita et al. further teach "wherein said heterocyclic group contains at least one nitrogen atom in the ring of the heterocyclic group (paragraph 194)."

Regarding claim 22, Kunita et al. further teach "wherein said heterocyclic group has a 5- or 6-membered ring structure, and is optionally annelated with another ring system (paragraph 195)."

Regarding claim 23, Kunita et al. further teach "wherein said heterocyclic group has a 5- or 6-membered ring structure, and is optionally annelated with another ring system (paragraphs 195 and 196)."

Regarding claim 24, Kunita et al. further teach "wherein said heterocyclic group has a 5- or 6-membered ring structure, and is annelated with another ring system (paragraphs 195 and 196)."

Regarding claim 25, Kunita et al. further teach "wherein the heterocyclic group is selected from an optionally substituted tetrazole, triazole, thiadiazole, oxadiazole, imidazole, benzimidazole, thiazole, benzthiazole, oxazole, benzoxazole, pyrazole, pyrrole, pyrimidine, pyrasine, pyridasine, triazine or pyridine group (paragraph 196)."

Regarding claim 26, Kunita et al. further teach "wherein said polymer comprising a phenolic monomeric unit is a novolac, resol or polyvinylphenol (paragraphs 190-191 and paragraph 197. See also the discussion above with regards to claim 16)."

Regarding claim 28, Kunita et al. further teach “wherein --S-(L)<sub>k</sub>-Q comprises the following formula wherein Z represents the necessary atoms to form a 5- or 6-membered heterocyclic aromatic group, and is optionally annelated with another ring system (paragraph 196, line 4).”

Regarding claim 31, Kunita et al. further teach “wherein --S-(L)<sub>k</sub>-Q comprises the following formula wherein X is O, S or NR<sup>3</sup>, wherein R is selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen or -L<sup>1</sup>-R<sup>2</sup>, where in L<sup>1</sup> is a linking group, wherein R<sup>2</sup> is selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen or --CN, wherein R<sup>3</sup> is selected from hydrogen or an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, or wherein at least two groups selected from R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> represent the necessary atoms to form a cyclic structure (paragraph 196).”

Regarding claim 32, Kunita et al. further teach “wherein --S-(L)<sub>k</sub>-Q comprises the following formula wherein X is O, S or NR<sup>4</sup>, wherein R<sup>1</sup> and R<sup>2</sup> are independently selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen or -L<sup>1</sup>--R<sup>3</sup> wherein L<sup>1</sup> is a linking group, wherein R<sup>3</sup> is selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen or --CN, wherein R<sup>4</sup> is selected from hydrogen or an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or

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heteroaralkyl group, or wherein at least two groups selected from  $R^1$ ,  $R^2$ ,  $R^3$  and  $R^4$  together represent the necessary atoms to form a cyclic structure (paragraph 196)."

Regarding claim 33, Kunita et al. further teach "wherein  $--S-(L)_k-Q$  comprises the following formula wherein  $n$  is 0, 1, 2, 3 or 4, wherein  $X$  is O, S or  $NR^5$ , wherein each  $R^1$  is independently selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen,  $--SO_2--NH--R^2$ ,  $--NH--SO_2--R^6$ ,  $--CO--NR^2--R^3$ ,  $--NR^2--CO--R^6$ ,  $--NR^2--CO--NR^3--R^4$ ,  $--NR^2--CS--NR^3--R^4$ ,  $--NR^2--CO--O--R^3$ ,  $--O--CO--NR^2--R^3$ ,  $--O--CO--R^6$ ,  $--CO--O--R^2$ ,  $--CO--R^2$ ,  $--SO_3--R^2$ ,  $--O--SO_2--R^6$ ,  $--SO_2--R^2$ ,  $--SO--R^6$ ,  $--P(=O)(--O--R^2)(--O--R^3)$ ,  $--O--P(=O)(--O--R^2)(--O--R^3)$ ,  $--NR^2--R^3$ ,  $--O--R^2$ ,  $--S--R^2--CN$ ,  $--NO_2$  or  $--M--R^2$ , wherein  $M$  represents a divalent linking group containing 1 to 8 carbon atoms, wherein  $R^2$  to  $R^5$  are independently selected from hydrogen or an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, wherein  $R^6$  is an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, or wherein at least two groups selected from each  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  and  $R^6$  represent the necessary atoms to form a cyclic structure (paragraph 196)."

Regarding claim 34, Kunita et al. further teach wherein  $--S-(L)_k-Q$  comprises the following formula wherein  $n$  is 0, 1, 2 or 3, wherein each  $R^1$  is independently selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen,  $--SO_2--NR--R^2$ ,  $--NR--SO_2--R^5$ ,  $--CO--NR^2--R^3$ ,  $--NR^2--CO--R^5$ ,  $--NR^2--CO--NR^3--R^4$ ,  $--NR^2--CS--NR^3--R^4$ ,  $--NR^2--CO--O--$



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-R<sup>3</sup>, --O--CO--NR<sup>2</sup>--R<sup>3</sup>, --O--CO--R<sup>5</sup>, --CO--O--R<sup>2</sup>, --CO--R<sup>2</sup>, --SO<sub>3</sub>--R<sup>2</sup>, --O--SO<sub>2</sub>--R<sup>5</sup>, --SO<sub>2</sub>--R<sup>2</sup>, --SO--R<sup>5</sup>, --P(=O)(--O--R<sup>2</sup>)(--O--R<sup>3</sup>), --O--P(=O)(--O--R<sup>2</sup>)(--O--R<sup>3</sup>), --NR<sup>2</sup>--R<sup>3</sup>, --O--R<sup>2</sup>, --S--R<sup>2</sup>, --CN, --NO<sub>2</sub> or -M--R<sup>2</sup>, wherein M represents a divalent linking group containing 1 to 8 carbon atoms, wherein R<sup>2</sup> to R<sup>4</sup> are independently selected from hydrogen or an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, wherein R<sup>5</sup> is an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, or wherein at least two groups selected from each R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> together represent the necessary atoms to form a cyclic structure (paragraph 196)."

Regarding claim 35, Kunita et al. further teach "wherein --S-(L)<sub>k</sub>-Q comprises the following formula wherein n is 0, 1, 2 or 3, wherein each R<sup>1</sup> is independently selected from hydrogen, an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, halogen, --SO<sub>2</sub>--NR--R<sup>2</sup>, --NR--SO<sub>2</sub>--R<sup>5</sup>, --CO--NR<sup>2</sup>--R<sup>3</sup>, --NR<sup>2</sup>--CO--R<sup>5</sup>, --NR<sup>2</sup>--CO--NR<sup>3</sup>--R<sup>4</sup>, --NR<sup>2</sup>--CS--NR<sup>3</sup>--R<sup>4</sup>, --NR<sup>2</sup>--CO--O--R<sup>3</sup>, --O--CO--NR<sup>2</sup>--R<sup>3</sup>, --O--CO--R<sup>5</sup>, --CO--O--R<sup>2</sup>, --CO--R<sup>2</sup>, --SO<sub>3</sub>--R<sup>2</sup>, --O--SO<sub>2</sub>--R<sup>5</sup>, --SO<sub>2</sub>--R<sup>2</sup>, --SO--R<sup>5</sup>, --P(=O)(--O--R<sup>2</sup>)(--O--R<sup>3</sup>), --O--P(=O)(--O--R<sup>2</sup>)(--O--R<sup>3</sup>), --NR<sup>2</sup>R<sup>3</sup>, --O--R<sup>3</sup>, --S--R<sup>2</sup>, --CN, --NO<sub>2</sub> or -M--R<sup>2</sup>, wherein M represents a divalent linking group containing 1 to 8 carbon atoms, wherein R<sup>2</sup> to R<sup>4</sup> are independently selected from hydrogen or an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl group, wherein R<sup>5</sup> is an optionally substituted alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclic, aryl, heteroaryl, aralkyl or heteroaralkyl

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group, or wherein at least two groups selected from each  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$  and  $R^5$  together represent the necessary atoms to form a cyclic structure (paragraph 196)."

Regarding claims 36 and 37, Kunita et al. further teach "wherein the heterocyclic group is selected from an optionally substituted tetrazole, triazole, thiadiazole, oxadiazole, imidazole, benzimidazole, thiazole, benzthiazole, oxazole, benzoxazole, pyrazole, pyrrole, pyrimidine, pyrasine, pyridasine, triazine or pyridine group (paragraph 196)."

Regarding claim 38, Kunita et al. further disclose "wherein said polymer comprising a phenolic monomeric unit is a novolac (paragraph 191)."

2. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunita et al., Kinsho et al., Ding et al. and AAPA, as applied to claim 16 above, further in view of Umeda et al. (JP 05-127402 A).

Regarding claims 29 and 30, Kunita et al. as modified fail to disclose the specific structures claimed, but Kunita et al. teach the general concept of adding optionally annelated 5-member aromatic heterocyclic rings containing nitrogen (paragraphs 195-196). Umeda et al. discloses the specific structures claimed (see compound II-105) used as anti-oxidants in a photosensitive layer (abstract), and uses them along with the other types claimed by applicants. One having ordinary skill in the art would therefore recognize that the specific chemicals claimed in claims, 29 and 30 are art-recognized equivalents and would have been motivated to substitute any one for those disclosed by Kunita et al.

Regarding claims 29 and 30, see the compound II-105 of Umeda et al. This compound meets the general structure of all the claims.

### ***Response to Arguments***

3. Applicants' argument with respect poly(vinylphenols) not being polyvinyl polymers has been considered but is moot in view of the new ground(s) of rejection.
4. In response to applicants' arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).
5. Applicants' argument that Ding et al. do not show covalently attaching a sulfur-containing group to a carbon atom of the aromatic group is irrelevant since Ding et al. is relied upon for showing that substituting on a carbon atom of an aromatic group of a polyvinylphenol is known in the art, and also to teach that doing so controls the solubility in aqueous solvents. The presence or absence of a sulfur atom in the methodology of Ding et al. is irrelevant to the analysis at hand since the limitation of a sulfur compound is already addressed with the other prior art of record.
6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was

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within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

7. Finally, applicants argue that there is no reason found in the prior art to covalently link the sulfur atom to the carbon atom of the phenyl ring. This is found unpersuasive since it has been shown that substituting on the carbon atom of the phenyl ring leads to increased solubility, by way of the presence of more hydroxyl groups, as evidenced by Ding et al. Further, it has been shown, by way of Kunita et al. and Kinsho et al., that substitution on a novolac backbone with heterocyclic compounds by way of sulfur increases film strength. Therefore, it is maintained that one having ordinary skill in the art would have been motivated to arrive at the claimed invention with the expected results of increasing film strength.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA D. ZIMMERMAN whose telephone number is (571)272-2749. The examiner can normally be reached on M-R 8:30A - 6:00P, Alternate Fridays 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Judy Nguyen/  
Supervisory Patent Examiner, Art Unit 2854

Joshua D Zimmerman  
Examiner  
Art Unit 2854

jdz